

Solar Flares

Because the Earth resides in the atmosphere of our nearest stellar neighbor, events occurring on the Sun's surface directly affect us by interfering with satellite operations and communications, astronaut safety, and, in extreme circumstances, power grid stability. Solar flares, the most energetic events in our solar system, are a substantial source of hazardous space weather affecting our increasingly technology-dependent society. While flares have been observed using ground-based telescopes for over 150 years, modern space-borne observatories have provided nearly continuous multi-wavelength flare coverage that cannot be obtained from the ground. We can now probe the origins and evolution of flares by tracking particle acceleration, changes in ionized plasma, and the reorganization of magnetic fields. I will walk through our current understanding of why flares occur and how they affect the Earth and also show several examples of these fantastic explosions.